



INTERNATIONAL GROUP FOR LEAN CONSTRUCTION

DUBLIN | IRELAND | 1ST - 7TH JULY 2019

Introduction

**1780 –
Mechanization**



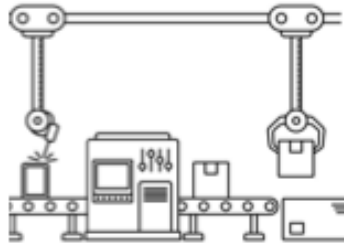
Industrial production
based on machines
powered by water
and steam

**1880 –
Electrification**



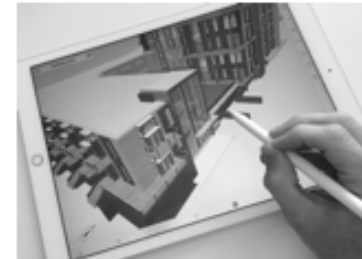
Mass-production
using assembly lines

**1970 –
Automation**



Automation using
electronics and
computers

**2000 –
Digitalization**



Introduction of
connected devices
and data analytics

**Today –
Artificial intelligence**

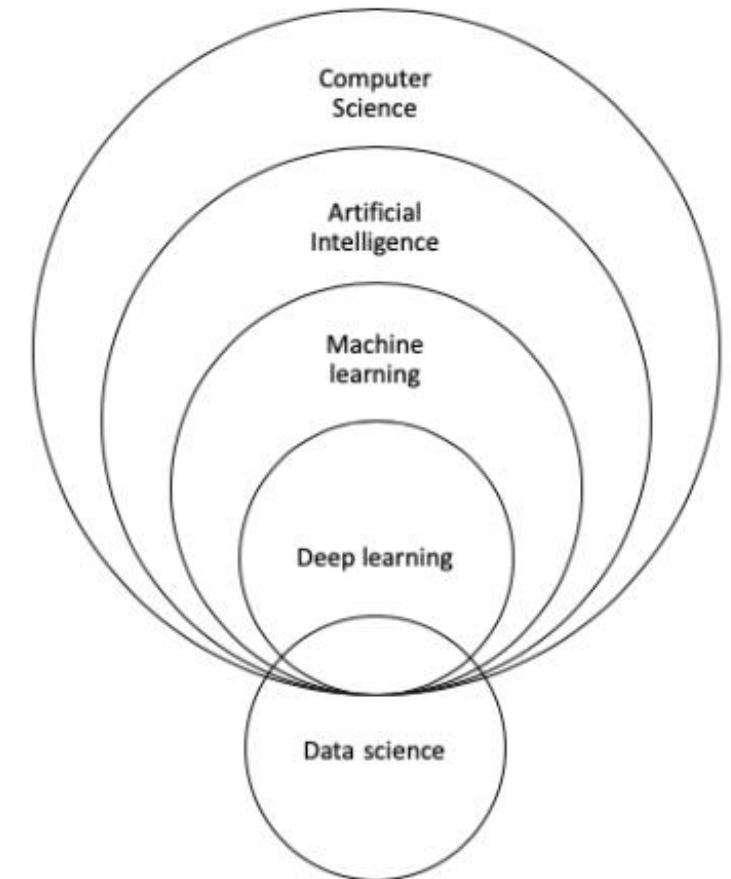


Use of big data and
machine learning

Introduction

➤ What is Artificial Intelligence (AI)?

The ability of a machine to mimic intelligent human behavior, thus seeking to use human-inspired algorithms for approximating conventionally challenging problems ¹.



1. Salehi and Burgueño (2018)

The Introduction of AI in the Construction Industry and its Impact on Human Behavior

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Introduction

➤ Purpose and research questions

- Purpose of the study:
 - How the construction industry can close the *gap* between the *potential* benefits and the *harvested* benefits of the implementation of AI.
- Research questions (RQ):
 - RQ1: What are the potential benefits of implementing AI in the construction industry?
 - RQ2: How does the construction industry harvest the benefits of AI implementation today?

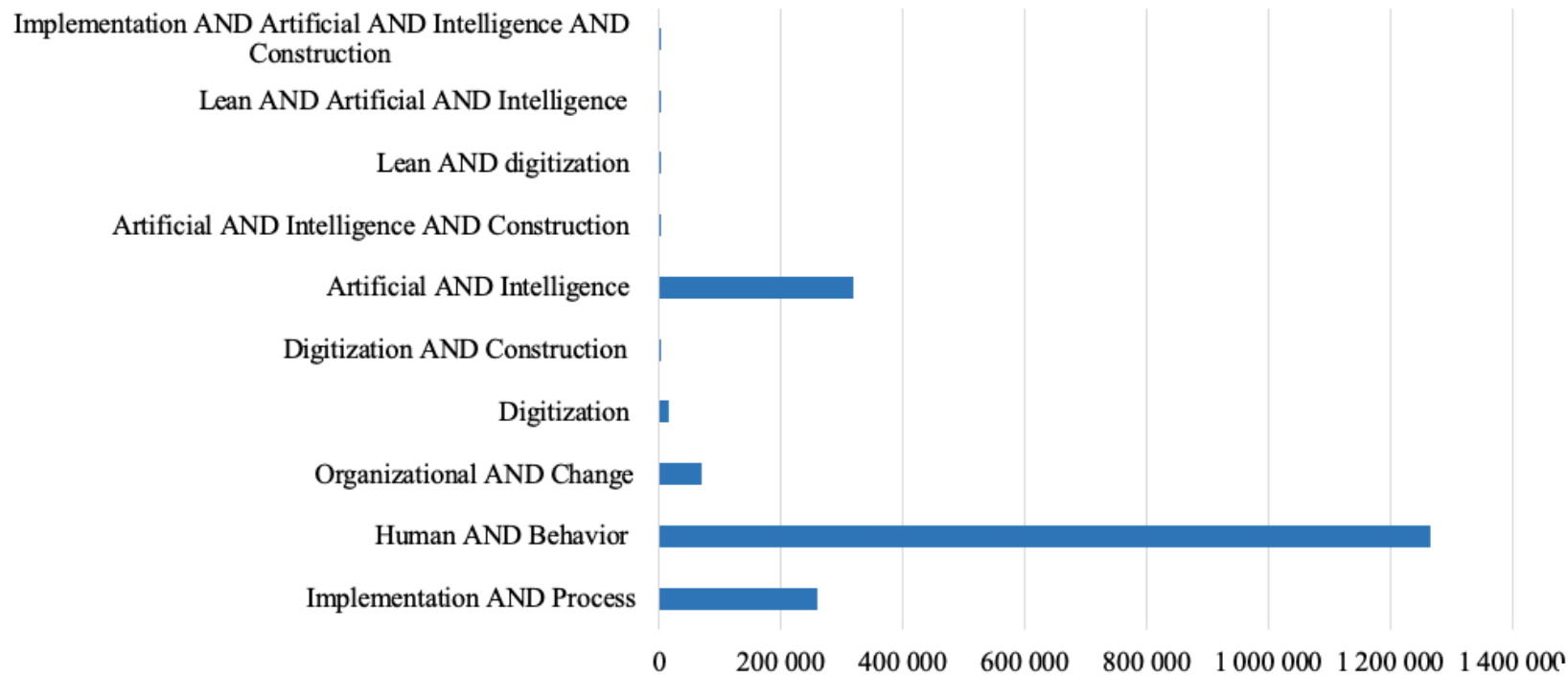
Method

Literature study

External interviews

Case study

Aim: Mapping already existing research on the topic.



Method

Literature study

External interviews

Case study

Aim: Unveil useful experiences from other industries that may be transferable to the construction industry.



inmeta

SPACEMAKER

Method

Literature study

External interviews

Case study

Aim: Obtain data from an ongoing project.



- 17 semi—structured in-depth interviews
- Document study

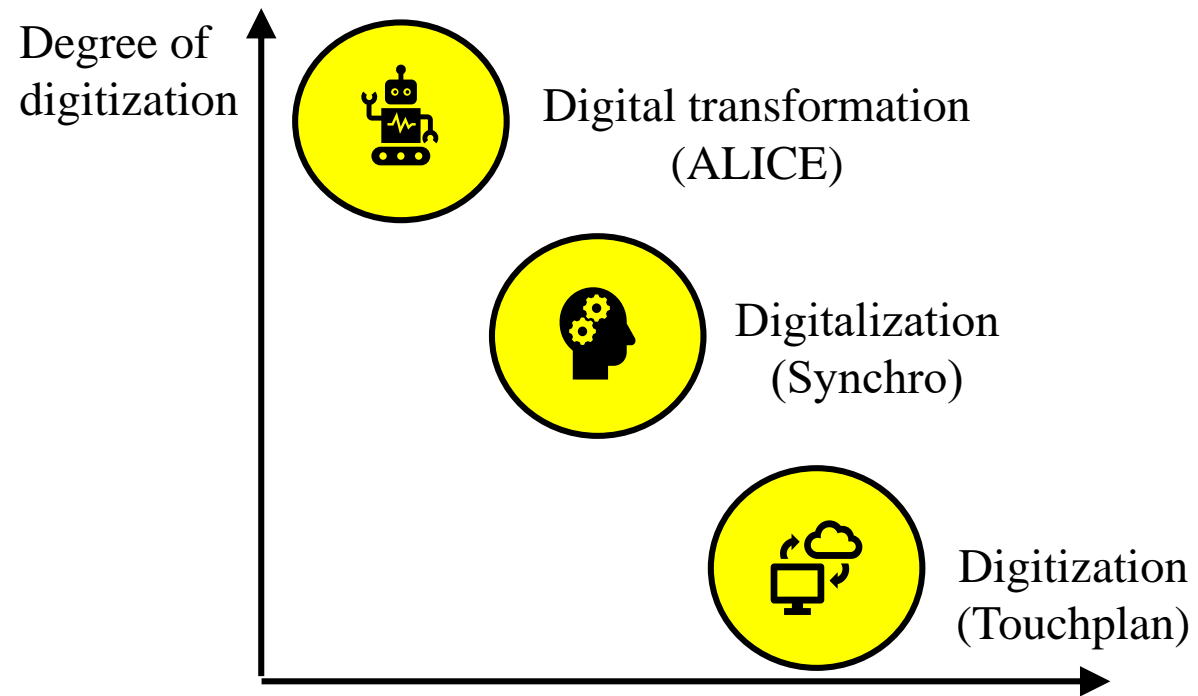


Theoretical Framework

Digitization

Digitalization

Digital Transformation

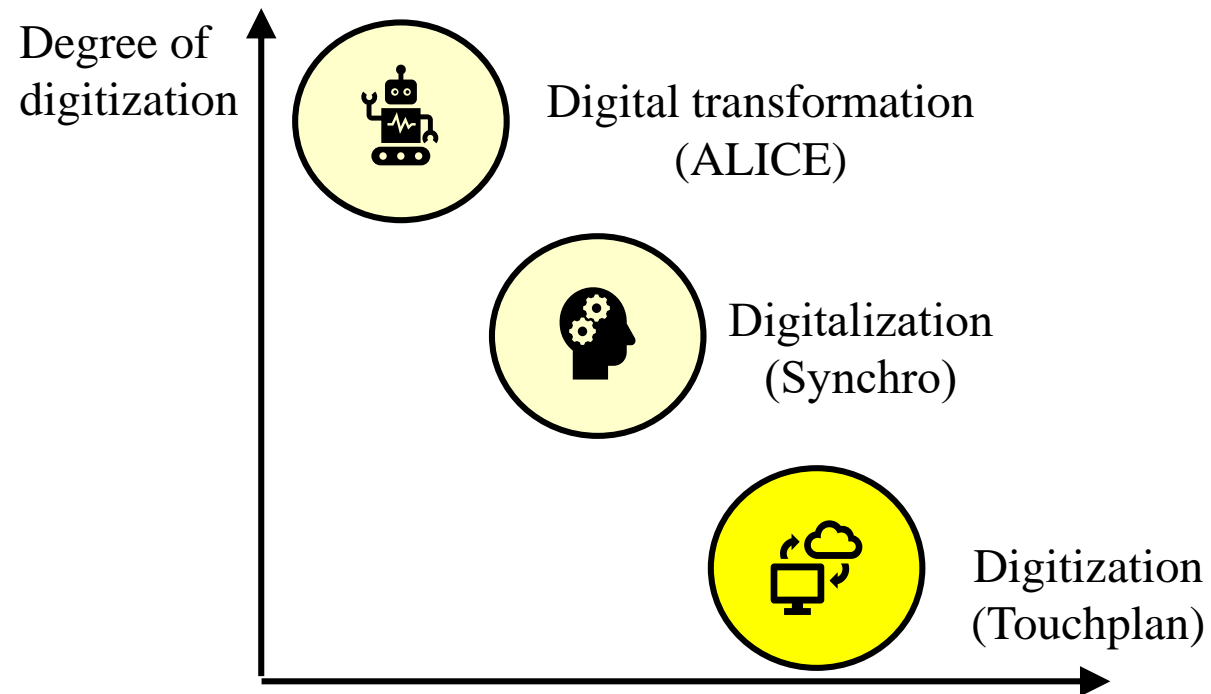


Theoretical Framework

Digitization

Digitalization

Digital Transformation



- Digitization: Creating a digital version of analog information ².
 - Checklists on your mobile device instead of paper.
 - Touchplan: Digital version of the Last Planner System (LPS).

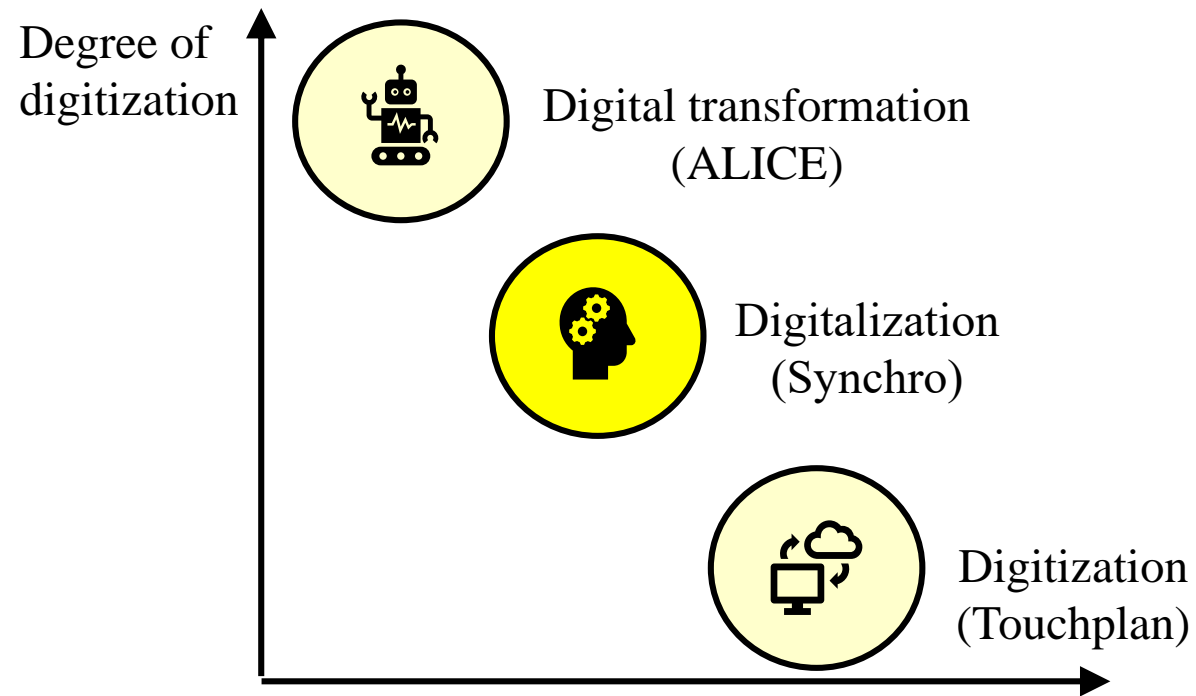


Theoretical Framework

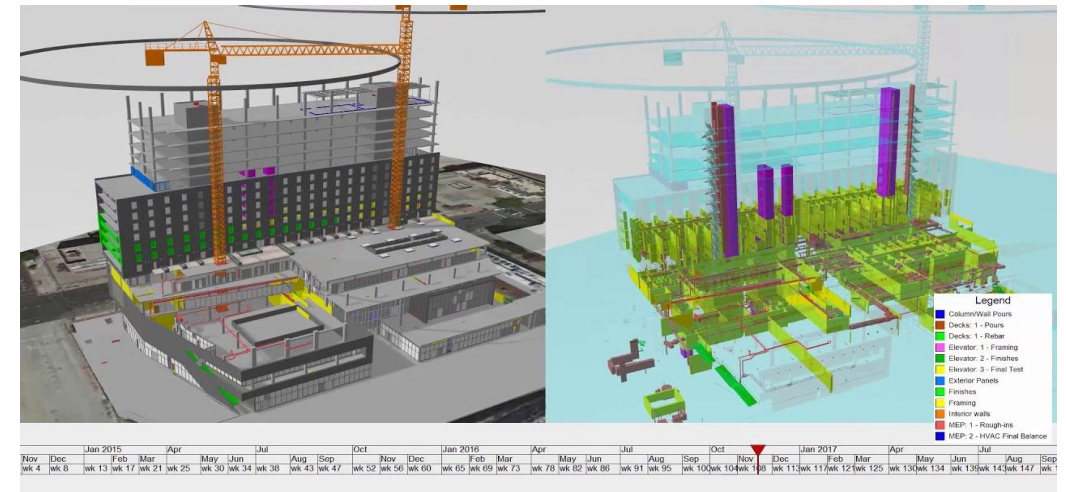
Digitization

Digitalization

Digital Transformation



- Digitalization: Where machines performs human-controlled processes².
 - Continuously updating your BIM.
 - Synchro: 4D planning Software

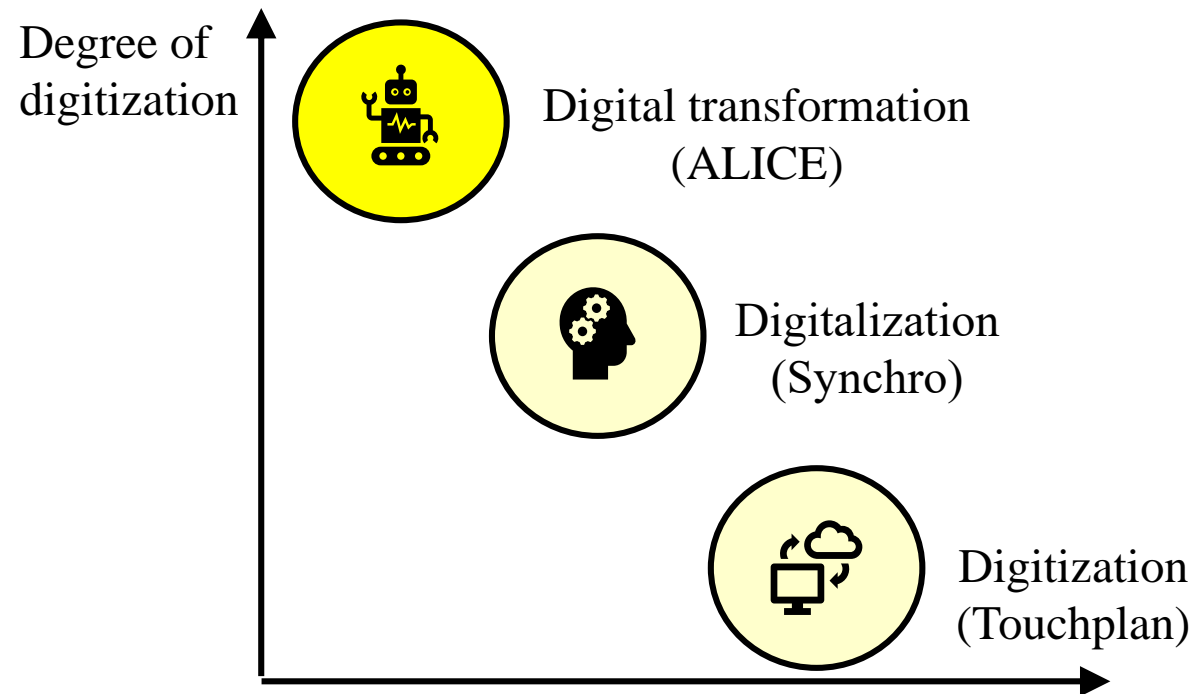


Theoretical Framework

Digitization

Digitalization

Digital Transformation



- Digital transformation: Integration of digital technologies in a way that the organization fundamentally change how they operate ².
- Successful implementation of AI.
- ALICE: Artificial intelligence planning Software

Theoretical Framework

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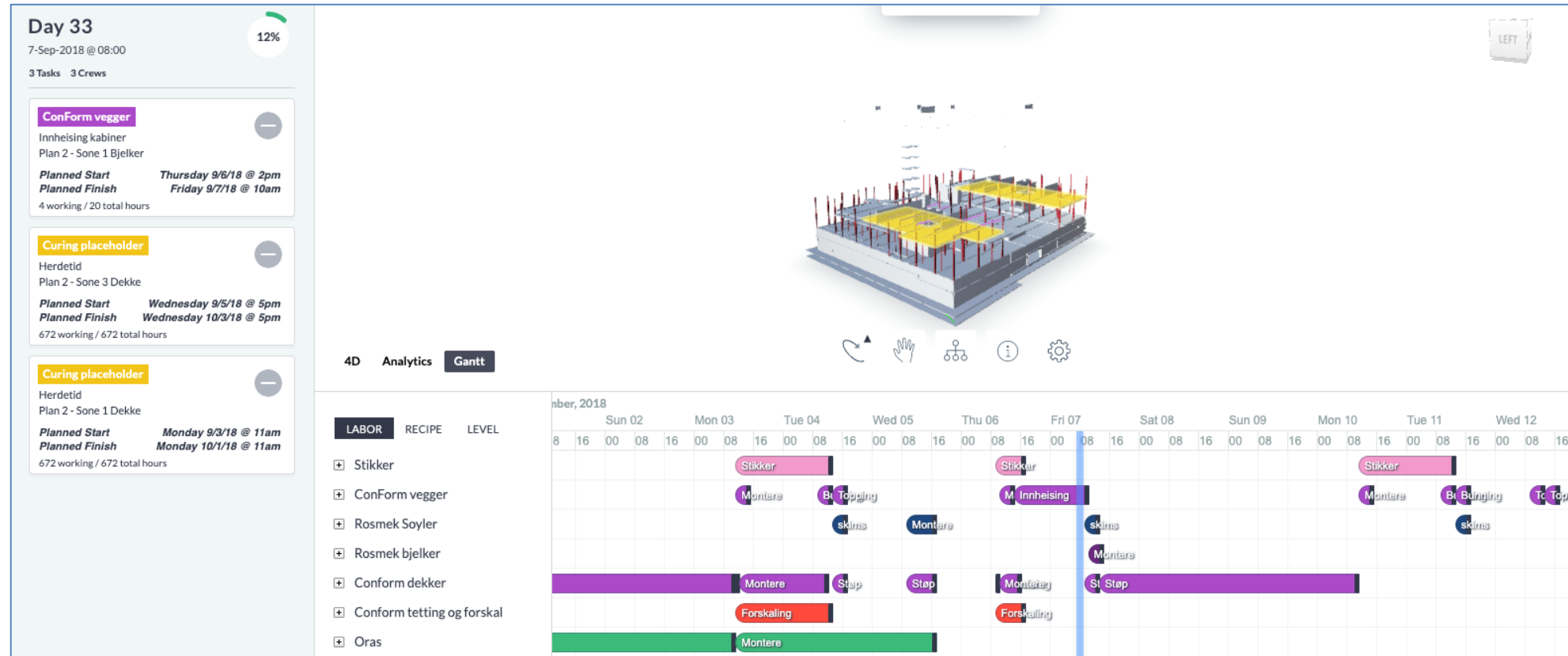


Theoretical Framework

Digitization

Digitalization

Digital Transformation



Findings

Research question 1

Research question 2

Purpose

- What are the potential benefits of implementing AI in the construction industry?

Technology

- Analyze millions of “what ifs” situations



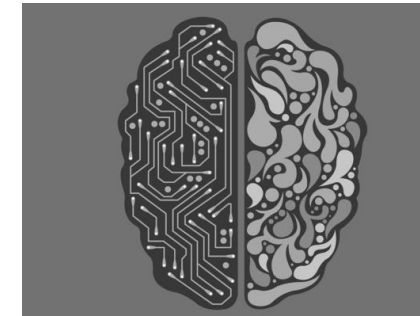
Process

- Decision-making support



Culture

- Act on statistics



Increased productivity

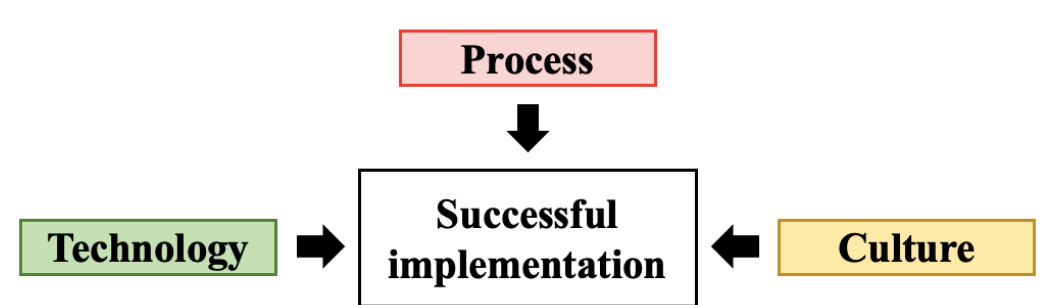
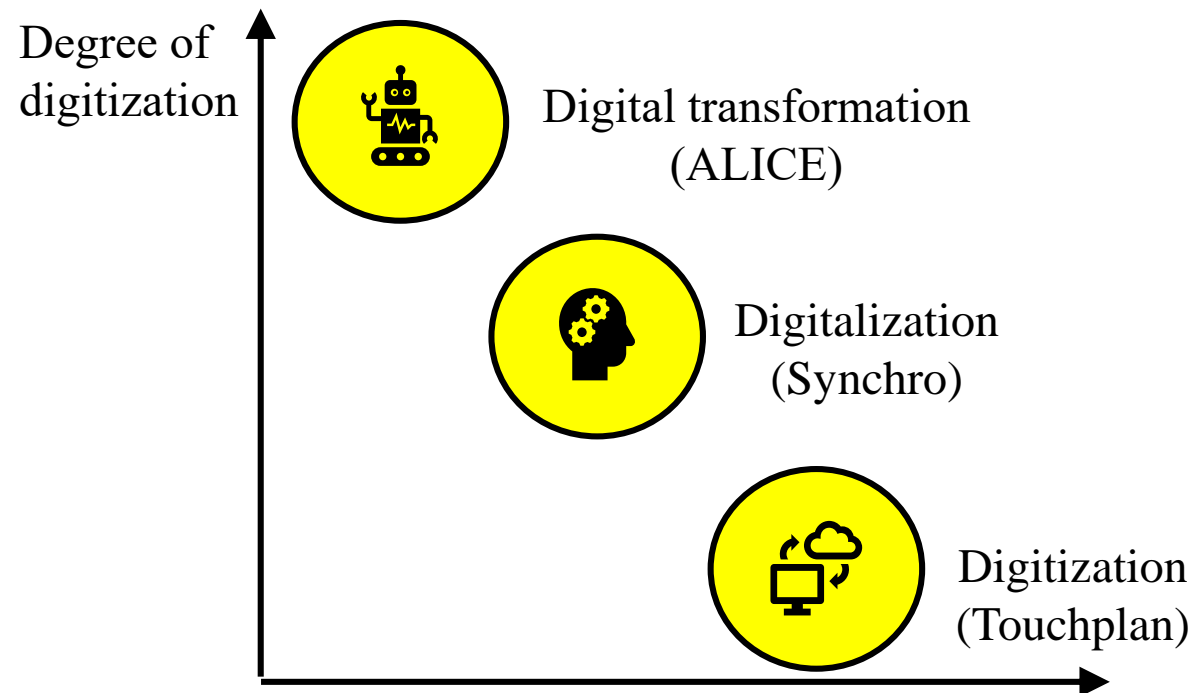
Findings

Research question 1

Research question 2

Purpose

- How does the construction industry harvest the benefits of AI implementation today?



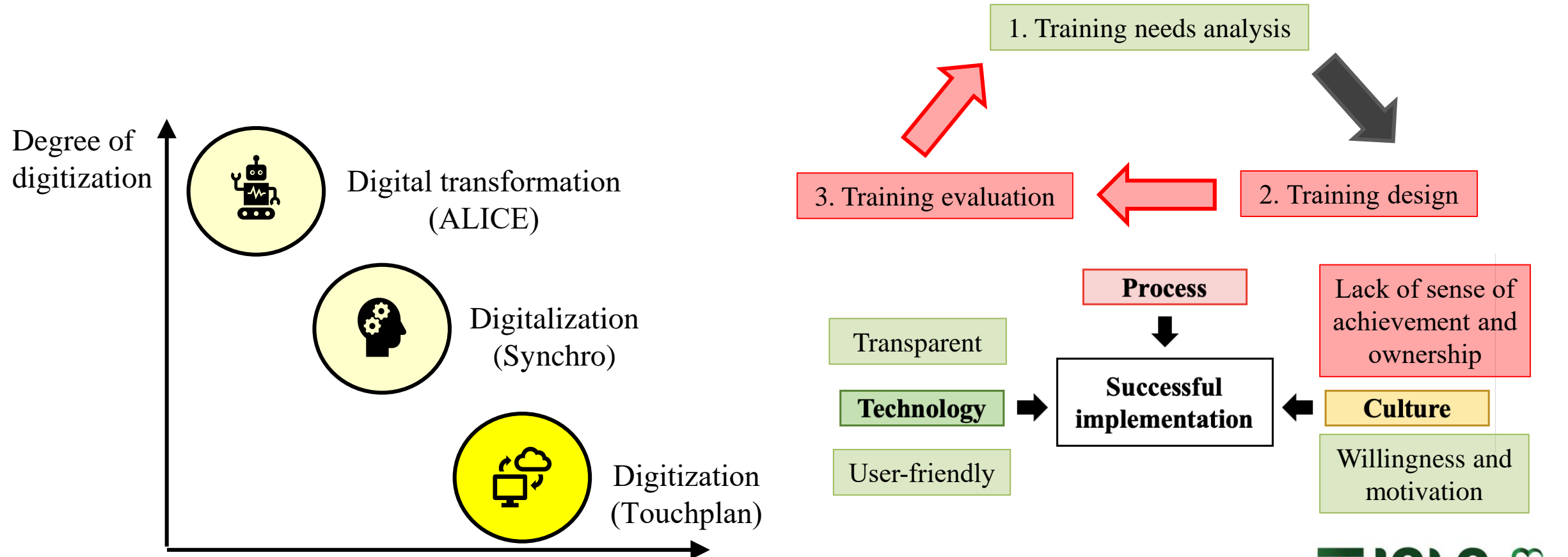
Findings

Research question 1

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Purpose

- How does the construction industry harvest the benefits of AI implementation today?



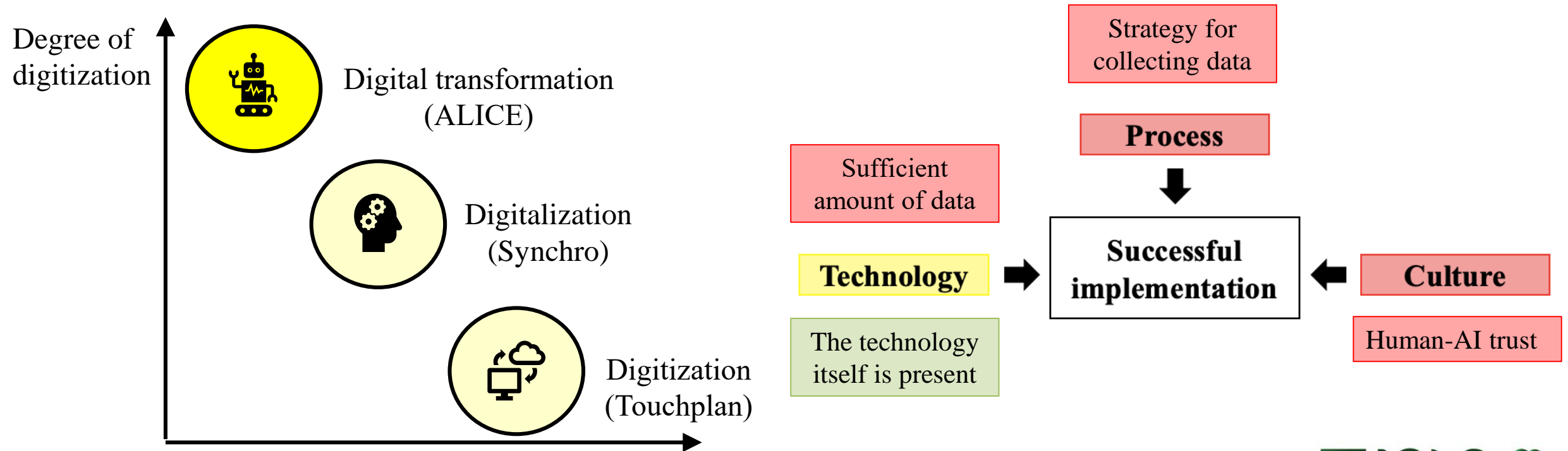
Findings

Research question 1

Research question 2

Purpose

- How does the construction industry harvest the benefits of AI implementation today?



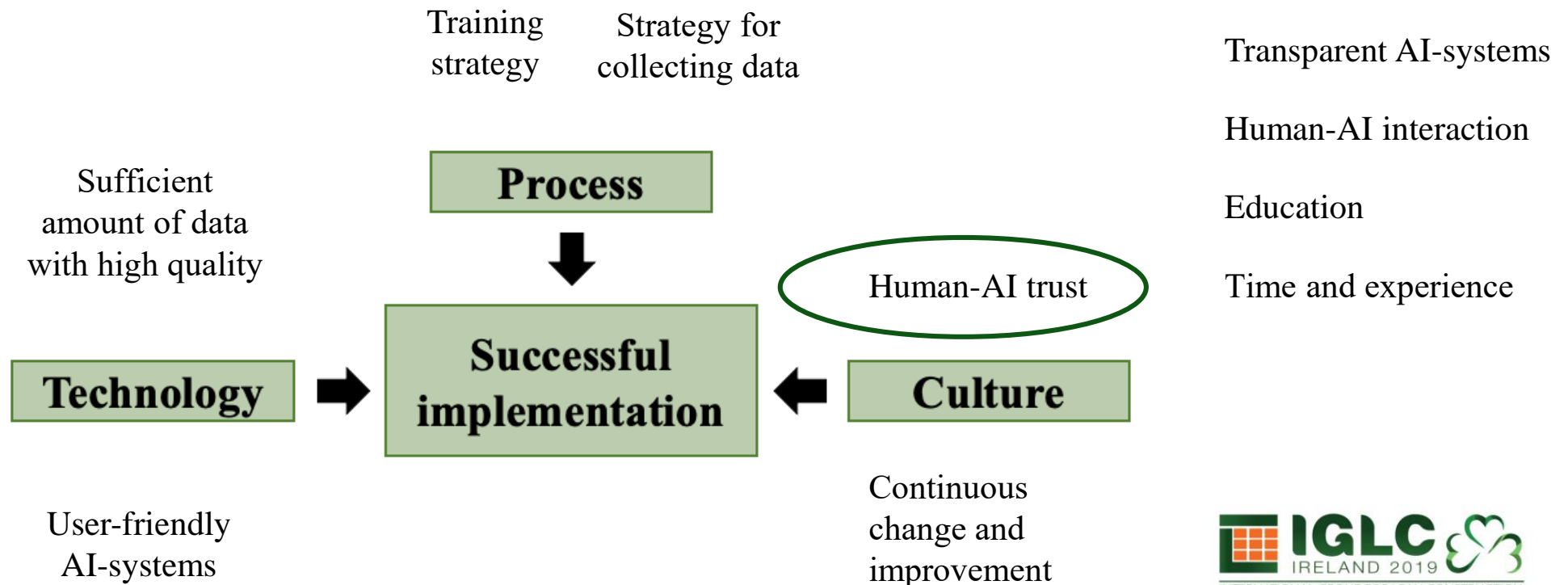
Findings

Research question 1

Research question 2

Purpose

- **How can the construction industry close the gap between the potential benefits and the harvested benefits of the implementation of AI?**



User-friendly
AI-systems

Closure

